

REMARKS

INTRODUCTION

Claims 1, 2, and 5-8 were previously pending and under consideration.

Claim 6 was previously withdrawn by constructive election.

Claims 3, 4 and 7 have been cancelled.

Claim 9 has been added.

Therefore, claims 1-2 and 5, 6, 8, and 9 are now pending and under consideration.

Claims 1, 2, 5, and 8 stand rejected.

Claims 1, 6, and 8 have been amended herein.

No new matter is being presented, and approval and entry are respectfully requested.

REJECTION UNDER 35 USC § 112, FIRST PARAGRAPH

In the Office Action, claims 1 and 2 were rejected under 35 U.S.C. § 112, first paragraph. The rejection states that the specification is not enabled for "magnitude" or "absolute value". Figure 6 of the present application shows a table in which speed magnitudes are mapped to different acceleration values depending on whether the direction of movement is positive or negative, and depending on whether the acceleration is positive acceleration or deceleration. Therefore, it is submitted that there is support for different acceleration magnitudes for a given speed magnitude depending on whether an axis is accelerating or decelerating.

Withdrawal of the rejection is respectfully requested.

REJECTIONS UNDER 35 USC § 103

In the Office Action, at pages 2-4, claims 1, 2, and 8 were rejected as being obvious in view of Cheng. At pages 4 and 5, claim 5 was rejected as being obvious over Cheng in view of Kaneko.

These rejections are traversed and reconsideration is requested.

CHENG DOES NOT BASE ACCELERATIONS ON RESTRICTED ACCELERATION CURVE

Claim 1, for example, is amended to recite that "where for plural speeds of the speed-acceleration curve, corresponding plural predetermined accelerations of the speed-acceleration curve (or corresponding plural predetermined decelerations) are based on, or equal to, or approximations of plural corresponding accelerations (or decelerations) of a restricted acceleration curve for the corresponding axis". Claim 5 recites "a predetermined *restricted acceleration*". Claim 6 recites "where accelerations of at least a segment of the speed-to-acceleration mapping coincide with, or approximate, or are based on accelerations of a corresponding segment of a restricted acceleration mapping of the axis". Claim 8 recites "at least a segment of the speed-acceleration curve is equal to, or approximates, or is based on a corresponding segment of an acceleration-restriction curve of the axis being moved". Support for these features may be found at least at page 5 lines 7-9, page 6 lines 1-6, Figure 3, etc. Furthermore, "restricted acceleration curve" is a term of art, and a definition may be found at page 2, lines 3-6, and at page 3, lines 1-4. Support for "at least a segment of" and the like may be found at least at figure 3.

It is respectfully noted that according to MPEP § 2111.01, where a claim term (such as "restricted acceleration curve") has been clearly defined in the specification, that definition cannot be ignored when interpreting the claims.

The features discussed above may be understood by reference to the example shown in Figure 3. In Figure 3, between the dashed lines, plural of the speeds are mapped to corresponding plural accelerations that are equal, approximate to, or based on the actual restricted acceleration curve of the axis being controlled.

Figure 2 of the present specification shows a speed acceleration curve as has been used

in the prior art. In the prior art, roughly trapezoidal shaped curves have been used, and maximum acceleration has been limited to a single point of intersection between the restricted acceleration curve and the actual acceleration curve. See Figure 2 (prior art), where the actual acceleration curve and the restricted acceleration curve intersect at only one point. This intersection has defined the prior art maximum acceleration. Cheng, for example, also teaches acceleration curves that are limited to one point of intersection with the restricted acceleration curve. See column 6, lines 65-68 ("acceleration-speed limit curve is simply a straight line ... one line for acceleration and one line for deceleration"). Kaneko does not discuss restricted acceleration curves.

Kaneko

Kaneko discloses a torque curve, which is not analogous or equivalent to the restricted acceleration curve recited in the present claims. In general, acceleration or deceleration performance (e.g. a curve) can be determined based on friction and gravity acting on machine parts and also the torque characteristics of a motor. In other words, the character of a motor's torque is only one of the factors that can be used to determine acceleration and deceleration performance. See page 7, line 22 to page 8, line 4 of the present Specification.

In contrast to an acceleration curve, Kaneko discloses a speed-torque curve, where a motor is controlled for performance that will lie along the speed-torque curve. The speed-torque curve of Kaneko does not allow for taking into account factors such as friction and gravity acting on the machine.

Cheng

Figure 7 of Cheng shows the speed-acceleration curve that occurs in Cheng when accelerating or decelerating (and an explanatory diagram included herewith provides labels for Figure 7 of Cheng). Note that the positive acceleration curve has a plateau defined by one point on the positive restricted acceleration curve, and the negative speed-acceleration curve has a maximum deceleration at one point defined by a single point of intersection with the negative restricted acceleration curve. Thus it can be seen that Cheng does not use plural accelerations or plural decelerations that are based on, or approximate to, or equal to corresponding accelerations or decelerations of the restricted acceleration curve or the restricted deceleration curve (or segments thereof), respectively.

It is noted that even if Figure 7 of Cheng is interpreted as a single curve, the point of intersection with the restricted acceleration curve and the point of intersection with the restricted deceleration curve are not, together, plural accelerations, or plural decelerations. Furthermore, the acceleration values along the plateau line in the speed-acceleration curve are based on only one point; the point of intersection.

Claim 5 was rejected in further view of Kaneko. The rejection points to Figure 11 and column 1, lines 42-45. However, this portion of Kaneko is further described in Figures 13(b) and 13(c), which show curves of the prior art type discussed above. Neither Kaneko nor Cheng discuss a restricted acceleration curve as defined in the present specification and as discussed above.

Withdrawal of the rejection of claims 1, 5, and 8 is respectfully requested.

CLAIM 6: AMENDED; AND RESTRICTION TRAVERSED

Claim 6 was restricted as directed to a robot. This limitation has been removed and claim 6 is now appropriately placed in the same subclass as the other pending claims. Because there is no other reason for the restriction of claim 6, the restriction is respectfully traversed. Entry and examination of claim 6 is respectfully requested.

CONCLUSION

There being no further outstanding objections or rejections, it is submitted that the application is in condition for allowance. An early action to that effect is courteously solicited.

Finally, if there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

STAAS & HALSEY LLP

Date: 20 JAN 2004

By: James T. Strom
James T. Strom
Registration No. 48,702

1201 New York Avenue, NW, Suite 700
Washington, D.C. 20005
Telephone: (202) 434-1500
Facsimile: (202) 434-1501